REMARKS

Applicants respectfully note the correct observation that it "is generally improper to read limitations contained in the specification into the claims" in the "Response to Arguments" section of the April 26, 2007 final office. In particular, it was stressed in this section that the "one-body" argument is not expressed in the claims. Although Applicants note that original claim 1, for example, did recite "the degree of the deployment as one body," the claims have been amended to make it explicit that the geometric shape chosen to model the spacecraft structure deployment is indeed a "one-body" geometric shape. In that regard, claim 1 as amended recites the act of "selecting a representative one-body geometric shape which resembles a deployed structure." Similarly, claim 8 as amended recites the act of "determining a one-body geometric shape that resembles the structure in a fully deployed configuration." Finally, claim 18 recites the act of "determining a one-body geometric shape that resembles the expandable structure in a fully expanded configuration." Accordingly, the pending claims are allowable as follows:

The rejection of claims 8-24 as being anticipated by the SD/Fast User's Manual.

To provide an accurate, yet computationally efficient, solution, Applicant uses a one-body modeling system. For example, as discussed with regard to the reflector antenna of Figure 1, a convenient one-body geometric shape that closely resembles the reflector antenna is the elliptical cylindrical shell of Figure 2. The deployment of this shell is modeled with regard to a time-varying function of a physical parameter, such as the length L(t) of the diagonal member 306 of Figure 3a and 3b. As explained in paragraphs 148 through 152, moments of inertia for the deployment may ultimately be related to the function L(t).

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Having successfully modeled the structure deployment, one should then address the interaction of the deployment with the remaining spacecraft structures using an articulated system of rigid bodies (bodies connect by joints) as discussed in paragraph 153. As set forth in paragraph 153, a conventional multi-body software tool that models the resulting articulated system is SD/Fast. Indeed, the SD/Fast manual shows a five-body spacecraft model in its Figure T3-1, page T-48. But note carefully that such a disclosure in no way suggests or discloses the modeling of structure deployment using " a one-body geometric shape that resembles the structure in a fully deployed configuration" based upon "generating time functions for a change in shape of at least one structural component of said structure, said change in shape occurring as said structure expands into said fully deployed configuration; and calculating mass properties of said geometric shape as a function of said time functions" as set forth in claim 8. Thus, claim 8 and its dependent claims 9-14 are patentable over the SD-Fast manual.

Claim 15 is limited to the modeling of structure deployment using a one-body cylindrical shell geometric model as discussed above with regard to Figure 2. In addition, claim 15 limits the time-varying function to relate to the length of a component (such as discussed above with regard to the diagonal member 306). Thus, claim 15 and its dependent claims 16 and 17 are allowable over the SD/Fast manual for at least the reasons discussed with regard to claim 8.

Claim 18 also recites the act of "determining a one-body geometric shape that resembles the expandable structure in a fully expanded configuration." Thus, claim 18 and its dependent claims 19-24 are also allowable over the SD/Fast manual.

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The rejection of claims 1-7 over the SD/Fast Manual in view of the Sayers thesis.

As discussed above, the SD/Fast manual is merely directed to the modeling of structures using an articulated system of rigid bodies. This is abundantly in the prior art – indeed, Applicant described the use of SD/Fast for just this purpose in paragraph 153. The SD/Fast manual shows a 5-body articulated model for a spacecraft in, for example, its Figure T3-1. The Sayer thesis adds nothing further to the SD/Fast manual in that it is also plainly directed to the modeling of structures using an articulated system of rigid bodies. What Sayer adds is that one or more of the bodies may be flexible – see, e.g., page 204 of Sayer, under the heading "Model Description." Thus, Sayer in no way suggests or discloses the modeling of spacecraft structure deployment based upon a one-body geometrical model using time-varying functions of at least one physical parameter of the one-body geometrical model. Because claim 1 recites the acts of "selecting a representative one-body geometric shape which resembles a deployed structure; and generating time-varying mass properties of said geometric shape as a function of a physical parameter of said deployed structure," claim 1 (and its dependent claims 2-7) are plainly allowable over the combination of the SD/Fast manual and the Sayer thesis.

CONCLUSION

In view of the foregoing arguments, Applicant respectfully submits that the pending claims are in proper form for allowance. Reconsideration and withdrawal of the rejections are respectfully requested and a timely Notice of Allowance is solicited.

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If there are any questions regarding any aspect of the application, please call the undersigned at (949) 752-7040. The Commissioner is hereby authorized to charge any additional fees that may be required to counsel's Deposit Account No. 50-2257.

Certification of Facsimile Transmission

I hereby certify that this paper is being facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

Saundra L. Carr — July 25, 2007
Saundra L. Carr — Date of Signature

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